
M014: MOUNTAIN STREAM CROSSING

TSP Number/Title	M014:Mountain Stream Crossing
Effective Date	Implement next class iteration upon receipt
Supersedes TSP(s)/Lessons	None
TSP User	The following courses use this TSP: Mountain Instructor Qualification Course (MIQC) Basic Mountaineering Course (BMC) Assault Climber Course (ACC)
Proponent	United States Army Alaska, Northern Warfare Training Center
Improvement Comments	Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: ATTN: TRAINING ADMINISTRATOR COMMANDANT USARAK NWTC 1060 GAFFNEY ROAD #9900 FORT WAINWRIGHT AK 99703-9900
Security Clearance/Access	Public domain
Foreign Disclosure Restrictions	The Lesson Developer in coordination with the USARAK NWTC foreign disclosure authority has reviewed this lesson. This lesson is releasable to foreign military students from all requesting foreign countries with Approval of Commandant USARAK NWTC.

Purpose

This training support package provides the instructor with a standardized lesson plan for presenting instruction for:

Task Number	Task Title
VIII.0900	Mountain Stream Crossing

Technique of Delivery

Lesson Number	Instructional Strategy	Media
M014	Class and Practical Exercise	None

This TSP contains

Table of Contents		Page
Lesson	Section I, Administrative Data	3
	Section II, Introduction	6
	TLO: Conduct a mountain stream crossing	6
	Section III, Presentation	8
	ELO A: Identify a suitable location for a mountain stream crossing	8
	ELO B: Prepare personnel/equipment for a mountain stream crossing	9
	ELO C: Conduct individual crossing of a mountain stream	10
	ELO D: Conduct a team crossing of a mountain stream	11
	ELO E: Install a one rope bridge as a hand line for crossing a mountain stream	12
	ELO F: Cross a mountain stream utilizing a hand line	14
	ELO G: Describe survival swimming techniques used in mountain streams	15
	ELO H: Recover a hand line	16
	Section IV, Summary	17
	Section V, Student Evaluation	18

SECTION I ADMINISTRATIVE DATA**All courses including this lesson**

Course Number	Course Title
NA	Mountain Instructor Qualification Course
NA	Basic Mountaineering Course
NA	Assault Climber Course

Task(s) Taught or Supported

Task Number	Task Title
VIII.0900.01	Identify a suitable location for a mountain stream crossing
VIII.0900.02	Prepare personnel/equipment for a mountain stream crossing
VIII.0900.03	Conduct individual crossing of a mountain stream
VIII.0900.04	Conduct a team crossing of a mountain stream
VIII.0900.05	Install a one rope bridge as a hand line for crossing a mountain stream
VIII.0900.06	Cross a mountain stream utilizing a hand line
VIII.0900.07	Describe survival swimming techniques used in mountain streams
VIII.0801.08	Recover a hand line

Task(s) Reinforced

Task Number	Task Title
VI.0200	Risk Management for Mountain Operations
VIII.0300	Rope Management and Knots
VIII.0400	Anchors
VIII.0600	Belay Techniques
VIII.0804	Rope Installations (one rope bridge)

Test Lesson Number

Hours	Lesson Number	Lesson Title
	M020/M021/M022	BMC Mountaineering Review/ACC Mountaineering Review/MIQC Mountaineering Review

Prerequisite Lesson(s)

-M005, Risk Management for Mountain Operations
-M006, Mountain Travel and Walking Techniques, VIII.0100.05, VIII.0100.06, VIII.0100.07, VIII.0100.08, VIII.0100.09, VIII.0100.10;
-M008, Rope Management and Knots, VIII.0300.04, VIII.0300.06, VIII.0300.08, VIII.0300.09, VIII.0300.10, VIII.0300.11, VIII.0300.14, VIII.0300.15, VIII.0300.19;
-M009, Anchors, VIII.0400.01, VIII.0400.02, VIII.0400.03, VIII.0400.04;
-M011, Belay Techniques, VIII.0600.01, VIII.0600.03, VIII.0600.04, VIII.0600.05;
-Roped Climbing, VIII.0700.01, VIII.0700.03, VIII.0700.06.

References

Number	Title	Date	Additional Information
	NWTC Mountain Operations Manual	FY04	Updated yearly
FM 3-97.6	Mountain Operations	November 2000	http://www.adtdl.army.mil/
FM 3-97.61	Military Mountaineering	August 2002	http://www.adtdl.army.mil/

Student Study Assignment

Read TSP M014

Instructor Requirements

MIQC graduate, TAITC graduate

Additional Support Personnel Requirements	Number	Task
	2	Down stream safeties
	2	Near and far side monitors
	1	Upstream lookout
	1	Medic

Equipment Required

Instructor Equipment:

- Mountaineering helmet
- 3 x rope, static kernmantle, 11mm x 50m
- 1 x rope, demonstration, 10m
- 24 x PFD
- Risk Management Guide
- 2 x webbing, nylon, 1" x 5.5 ft.
- 2 x webbing, nylon, 1" x 9.5 ft.
- 2 x webbing, nylon, 1" x 25 ft.
- 1 x carabiner, locking, "D" shaped aluminum
- 1 x carabiner, locking, "D" shaped steel
- 4 x carabiner, non-locking, oval steel
- 1 x rope, dynamic kernmantle, 7mm x 6 ft.
- 1 x rope, dynamic kernmantle, 7mm x 12 ft

Student Equipment:

- Mountaineering helmet
- 3 x rope, static kernmantle, 11mm x 50m
- 1 x rope, demonstration, 10m
- PFD
- Risk Management Guide
- 2 x webbing, nylon, 1" x 5.5 ft.
- 2 x webbing, nylon, 1" x 9.5 ft.
- 2 x webbing, nylon, 1" x 25 ft.
- 1 x carabiner, locking, "D" shaped aluminum
- 1 x carabiner, locking, "D" shaped steel
- 4 x carabiner, non-locking, oval steel
- 1 x rope, dynamic kernmantle, 7mm x 6 ft.
- 1 x rope, dynamic kernmantle, 7mm x 12 ft
- Pen and notepad

Materials Required

Instructor Materials:

- NWTC Mountain Operations Manual
- Risk Management for Mountain Operations
- Signed Risk Assessment Worksheet from DCO, USARAK

Student Materials:

- NWTC Mountain Operations Manual
- Risk Management Guide for Mountain Operations

Classroom, Training Area and Range Requirements

The stream crossing training area must be large enough to facilitate 24 students working in teams and SGL.

Training area must have adequate routes with positions to place artificial anchors to facilitate the stream crossing.

Ammunition Requirements	None
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.

M014: MOUNTAIN STREAM CROSSING

SECTION II

INTRODUCTION

Method of instruction: Large Group
Type of instruction: Practical Exercise
Instructor to student ratio: 1:8
Time of instruction: 3 Hours
Media used: None

Motivator

Operations in mountainous terrain may often require the crossing of swift flowing rivers or streams. Such crossing should not be taken lightly. The force of the flowing water may be extreme and is most often underestimated. All rivers and streams are obstacles to movement that should be treated as danger areas and avoided whenever possible. When rivers or streams must be crossed, there are a variety of techniques, which the small unit leader may choose from, depending upon the type of stream, its width, speed of the current, and depth of water.

Terminal Learning Objective

ACTION:	Conduct a mountain stream crossing
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas, a 50 meter 11mm static Kernmantle or 120 foot Army Green line rope, and a climbing rack with adequate hardware and sling material
STANDARD:	Conduct a mountain stream crossing IAW the NWTC Mountain Operations Manual.

Safety Requirements

Ensure that students:

- Receive a risk assessment prior to movement to the training area and before practical exercises. Know that during the PE they must wear helmets, PFD's, and exercise caution whenever moving in and around mountain streams.
 - Have all necessary equipment for the PE's, to include any additional equipment required by the NWTC SOP.
 - Have two full canteens and drink adequate water to avoid becoming dehydrated.
 - Receive a briefing on the symptoms of heat injury or cold weather injury, as appropriate.
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Risk Assessment Level

High risk training approved by Deputy Commanding Officer USARAK.

Environmental Considerations

None

Evaluation

You will be evaluated on this task during the written test as per the NWTC training schedule for this course.

Instructional Lead-in

You have already had the classes on rope management and knots, anchors, and one rope bridge. You are going to take the knowledge from those classes and implement them into the mountain stream crossing.

One note of caution: there are limits on the safe use of these techniques. Not all mountain

rivers or streams will be able to be crossed with these techniques. If a water obstacle is too wide, swift, or deep, an alternate route will have to be used, or the crossing will require major bridging by engineers. It may require the use of rafts or boats. Reconnaissance of questionable crossing sites is essential. This chapter covers the techniques for crossing mountain streams which have a depth generally not exceeding waist deep.

SECTION III PRESENTATION

ELO A

ACTION:	Identify a suitable location for a mountain stream crossing
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas
STANDARD:	Identify a suitable location for a mountain stream crossing IAW the NWTC Mountain Operations Manual.

Learning Step/ Activity 1- Stream Crossing Site Selection

a. Reconnaissance of the route (map, and/or aerial photo) may not always reveal that a water obstacle exists. In a swamp, for example, un-fordable sloughs may not show on the map, and they may be concealed from aerial observation by a canopy of vegetation. Whenever it is possible that a unit will be required to cross a water obstacle, its commander must plan for some type of crossing capability.

b. Site selection is extremely important once you determine that you must make a crossing. Look for a high place from which you can get a good view of the obstacle and possible crossing sites. A distant view, perhaps from a ridge, is sometimes better than a hundred close views from a riverbank. Site selection must be made before the arrival of the main body.

c. A dry crossing on fallen timber or log jams is preferable to attempting a wet crossing. Depending upon the time of year, the closer you are to the source, or headwaters, the better your chances are of finding a natural snow or ice bridge for crossing. If a dry crossing is unavailable, the following considerations should be made:

1. The time of day of the crossing can be an important factor. Although early morning is generally best because the water level is normally lower during this period, recent weather is a big factor; there may have been heavy rain in the last eight hours. As glaciers, snow, or ice melt during the day, the rivers rise, reaching their maximum height between mid afternoon and late evening, depending on the distance from the source. Crossings, if made during the early morning, will also allow clothing to dry more quickly during the heat of the day.

2. A crossing point should normally be chosen at the widest, and thus shallowest, point of the river or stream. Sharp bends in the river should be avoided since the water is likely to be deep and have a strong current on the outside of the bend. Crossings will be easiest on a smooth, firm bottom. Large rocks and boulders provide poor footing and cause a great deal of turbulence in the water. Places where two channels come together usually have a deep hole and are capable of producing whirlpools. A 'riffle' is usually shallow, but the speed of the current usually increases and the bed is covered in rocks. Small outcrops of land or rocks that can produce whirlpools and should be avoided.

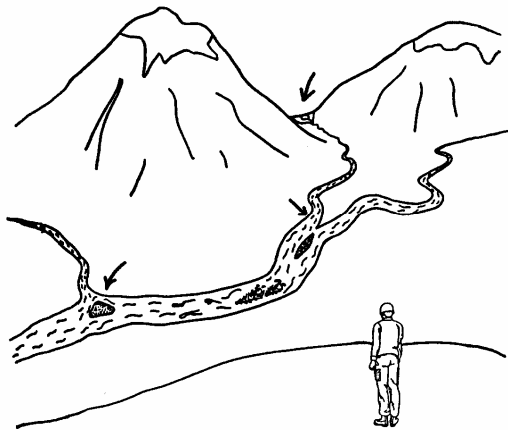
3. Many mountain streams, especially those which are fed by glacier run-off, contain sections with numerous channels. It is often easier to select a route through these braided sections rather than trying to cross one main channel. A drawback to crossing these braided channels, however, is the greater distance to the far bank may increase exposure time and often the sand and gravel bars between the channels will offer little cover or concealment, if any.

4. The crossing site should have low enough banks on the near and far side to allow a man carrying equipment to enter and exit the stream with relative ease. If a hand line or rope bridge is to be constructed, the crossing site should have suitable anchors on the near and far bank, along with safe loading and unloading areas. Natural anchors are not a necessity, however taking the extra time to find a site with solid natural anchors will probably be less than the time required to construct artificial anchors. In some areas, above the tree-line for example, artificial anchors may have to be constructed. Dead man anchors buried in the ground, or under a large pile of boulders work well.

5. Log jams and other large obstructions present their own hazards. Logs floating downstream will generally get hung up in shallower sections creating the log jam. Once a log jam is formed, however,

the water forced to flow around it will erode the stream bottom. Eventually deep drop-offs or holes may develop, especially around the sides and off the downstream end of the log jam. A log jam that totally bridges a section of the stream may be the best way to cross. A wet crossing in the vicinity of a log jam should be performed a good distance below or above it. Some things to consider when crossing near log jams are:

- a. Cross well to the downstream side when possible.
- b. Keep a sharp lookout for floating timber that could knock you off your feet.
- c. If you must cross on the upstream side stay well upstream from the log jam. If a person is swept off his feet and caught in the debris of the jam, he could easily drown. A hand line will greatly increase safety here.
- d. When possible, select a crossing site which has enough natural protection on the near and far banks so that security teams may be placed out and enough cover and concealment is available for the size of the element making the crossing. When cover and concealment is minimal, as in the higher alpine zones, the crossings must be conducted as efficiently as possible to minimize exposure to enemy observation.



NORMAL LOCATIONS OF SHALLOWEST WATER AND SAFEST CROSSING SITES

ELO B

ACTION:	Prepare personnel/equipment for a mountain stream crossing
CONDITION:	In a field environment given soldiers with individual equipment, adequate waterproofing material, with hardware and sling material, and personal floatation devices
STANDARD:	Prepare personnel/equipment for a mountain stream crossing IAW the NWTC Mountain Operations Manual.

Learning Step/ Activity 1- Preparation of Men, Weapons, and Equipment

a. Prepare men and equipment for a crossing as far in advance as feasible. Final preparation should be completed in a security perimeter on the near side just before crossing. Preparation includes:

1. Waterproof water-sensitive items. Wrap radios, binoculars, SOI, papers, maps and any extra clothing in waterproof bags (trash bags also work well), if available. These bags also provide additional buoyancy in case of a fall.

2. Trousers are un-bloused and shirts are pulled out of the trousers. All pockets are buttoned. This allows water to escape through the clothing. Otherwise the clothing would fill up and retain water

which would weigh the body down; especially critical if an individual ever has to swim to shore. Depending on the circumstances of the crossing (i.e., tactical situation, temperature of the air and water) the crossing can be made in minimal clothing so that dry clothing is available after the crossing. Boots should be worn to protect feet from rocks, however, socks and inner soles should be removed; on the far side the boots can be drained and dry socks replaced.

3. Load Carrying Equipment (LCE) harness and Load Bearing Vest (LBV) is unbuckled and worn loosely. It is extremely difficult to remove a buckled harness in

the water in an emergency.

4. Normally in slow moving streams with sandy or gravel bottoms, helmets are removed and placed in the rucksack. If you have to resort to swimming it is easier done without the helmet. However, when crossing swift flowing streams, especially those with large rocks and other debris, the risk of head injury if a person slips is high. In this case the helmet should be worn with the chinstrap fastened.

5. The rucksack should be worn well up on the shoulders and snug enough so it doesn't flop around and cause you to lose your balance. The waist strap **MUST** be unbuckled so you can get rid of the pack quickly if you are swept off your feet and have to resort to swimming. If a pack has a chest strap it must also be unbuckled. Secure everything well within your pack. It is easier to find one large pack than to find several smaller items.

6. Individual weapons should be attached to the pack or slung over the shoulder.

ELO C

ACTION:	Conduct an individual crossing of a mountain stream
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas
STANDARD:	Conduct an individual crossing of a mountain stream IAW the NWTC Mountain Operations Manual.

Learning Step/ Activity 1- Crossing the Stream

Demonstrate the task for students step by step. Upon completion of the demonstration, have the students practice. Allow 5 minutes for PE.

a. Whenever possible, and when the degree of experience permits, streams should be forded individually in order to affect a speedier crossing. The average soldier should be able to cross most streams with mild to moderate currents and water depths of not much more than knee deep using proper techniques. The individual crossing technique is as follows:

1. The individual should generally face upstream and at a 45° angle to the current, leaning slightly into the current to help maintain balance. At times, he may choose to face more sideways as this will reduce the surface area of the body against the current, thus reducing the current's overall force on the individual.

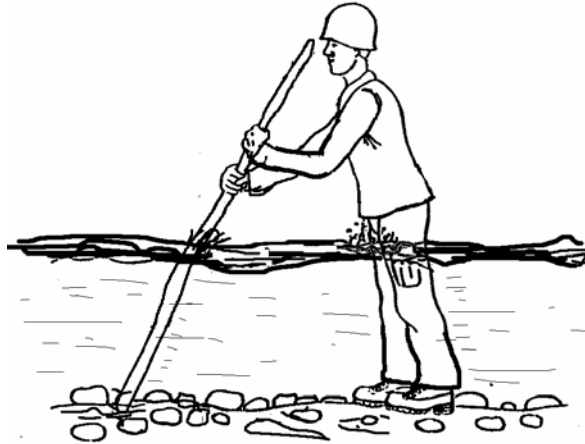
2. The feet should be shuffled along the bottom rather than lifted, with the downstream foot normally in the lead. He should take short, deliberate steps. Lunging steps and crossing the feet result in a momentary loss of balance and greatly increase the chance of a slip.

3. The individual should normally move across at a slight downstream angle. This way the person is not fighting the current. There is normally less chance of a slip when stepping off with the current as opposed to stepping off into the current.

4. The individual must constantly feel for obstacles, holes and drop-offs with the lead foot and

adjust his route accordingly. If an obstacle is encountered, the feet should be placed on the upstream side of it where the turbulence is less severe and the water normally shallower.

5. To increase balance, and if available, a long ice ax, sturdy tree limb, or other staff can be used to give the individual a third point of contact. The staff should be used on the upstream side of the individual and slightly leaned upon for support. The staff should be moved first, then the feet shuffled forward to it. This allows two points of contact to be maintained with the stream bed at all times. The individual still moves at a downstream angle with the downstream foot in the lead.



INDIVIDUAL CROSSING WITH STAFF

ELO D

ACTION:	Conduct a team crossing of a mountain stream
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas
STANDARD:	Conduct a team crossing of a mountain stream IAW the NWTC Mountain Operations Manual.

Learning Step/ Activity 1- Cross the stream

Demonstrate the task for students step by step. Upon completion of the demonstration, have the students practice. Allow 30 minutes for PE.

a. When the water level begins to reach thigh deep or anytime the current is too swift for personnel to safely perform an individual crossing, a team crossing may be used.

b. For additional safety, upstream lookouts and downstream safeties are necessary.

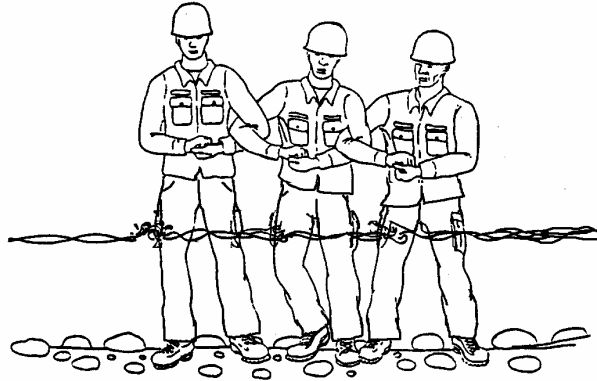
1. The downstream safety should be a strong swimmer and be equipped with a 30 meter rope in a throw-bag, and a flotation vest.

2. The upstream lookout is observing the stream for objects floating in the water that may present a hazard to the personnel crossing below.

3. Both the personnel are also security for the crossers.

c. For team crossing, two or more individuals cross arms with each other and lock their hands in front of themselves. The line formed faces the far bank. The largest individual should be on the upstream end of the line as he will break the current for the group. The line formed will then move across the stream using the same principles as for individual crossings, but with the added support of

each other. The line should cross parallel to the direction of the current. The team still moves at a slight downstream angle, stepping off with the downstream foot in the lead.



TEAM METHOD FOR STREAM CROSSING

ELO E

ACTION:	Install a one rope bridge as a hand line for crossing a mountain stream
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas, a 50 meter 11mm Kernmantle or 120 foot Army Green line rope, and a climbing rack with adequate hardware and sling material
STANDARD:	Install a one rope bridge as a hand line for crossing a mountain stream IAW the NWTC Mountain Operations Manual.

Learning Step /Activity 1- Crossing with a Hand Line

a. When the water level begins to reach waist deep or the current is too swift for even a team crossing, the chosen site must be closely examined. The stream at this point may very well be impassable. Many times though, a crossing site which may be unsafe for individual or team crossings can be made safe with the installation of a hand line or rope bridge. Crossing on a hand line will still require each individual to enter the water and get wet. If a one-rope bridge can be constructed, it may require only a couple of individuals to enter the water. Deciding whether to install a hand line or a rope bridge will depend on the anchors available, height of the anchors above the water, and the distance from the near and far anchors. The maximum distance a one-rope bridge is capable of spanning is approximately 1/2 to 2/3 the length of the rope in use.

b. Whether a hand line or rope bridge is to be installed, someone will have to cross the stream with one end of the rope and anchor it on the far side. This duty should be performed by the most capable and strongest swimmer in the party. The swimmer should be belayed across for his own safety. The belay position should be placed as far above the crossing as possible. In the event that the current is too strong for the individual, he will pendulum back to the near bank. Rescuers should be poised on the near bank at points where the individual will pendulum back, should he fail to reach the far bank. The initial crossing site should be free of obstacles that would snag the rope and prevent the pendulum back to the bank for an easy recovery.

c. The individual may attach the belay rope to his seat harness or a swami belt with a carabiner. NEVER tie directly into the rope when being belayed for a stream crossing. If the swimmer should be swept away and become entangled he must be able to release himself quickly from the rope and swim to shore as best he can. There is at least one recorded case (Wilderness Search and Rescue, Setnika 1980) where an individual, tied directly into his belay rope, was held underwater and drowned before he could be rescued. The individual may also choose to tie a fixed loop into the end of the belay rope and hang on to it, where he can immediately release it in an emergency.

d. Anytime a crossing site must be used where the swimmer may encounter problems getting to the

far bank, he should have on a life vest or other personal flotation device (PFD). If the swimmer must release the rope at any time, he will have to rely on his own water survival skills and swimming ability to get to shore. A PFD will greatly increase his personal safety. A PFD may also be used by the last man across, as he will release the rope from the anchor and be belayed across just as the first man.

e. Installation of a Hand-line: If it is possible to use a rope high enough above the water to enable soldiers to perform a dry crossing, then a rope bridge should be installed as such. If this is impossible, and the rope must be installed to assist in a wet crossing, then it should be installed as a hand line in the following manner.

1. The rope team commander will point out the tentative far side anchor to the first man across. He will also ensure there is a near side upstream lookout, down stream safety with appropriate equipment. He will also hook the soldiers into the system, and maintain a headcount of all personnel on his side of the river. The first man across carries no equipment with him except for what is absolutely necessary to anchor the rope. The far anchor should be downstream from the near anchor so that the rope will run at an angle downstream from the near anchor, approximately thirty to forty-five degrees, rather than straight across the stream. Here again, it is easier to move with the current as opposed to directly across or against it. The first man across will be come the far side commander.

2. The rope is anchored immediately on the far bank ensuring there is adequate space to unload the soldiers. This is accomplished by the far side rope team commander.

3. The rope is anchored on the near bank using a transport tightening system ensuring there is enough space to load the soldiers.

4. A second rope is used as a belay rope. It has a bowline on a bight tied in the center. One loop is fixed to the hand line with a carabiner; the second loop is fixed to the soldier with a carabiner on the swami belt. This rope provides additional safety in the event the soldier loses his grip on the hand line. This rope is carried across by the second man across who will become the far side upstream lookout. He also carries the first mans equipment across. The second will cross in the following manner:

- a. The near side end of the belay rope is held by a belayer to prevent its loss.

- b. The second man will clip directly to the hand line. The belay rope is clipped to the rear of his harness. He then begins to move across.

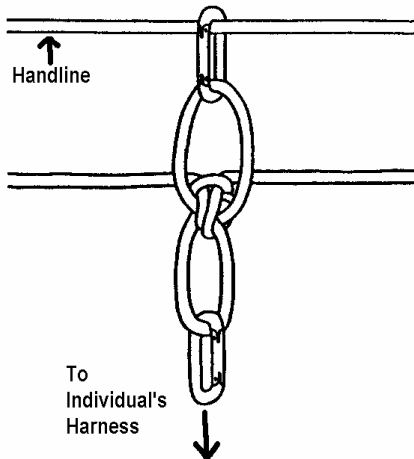
- c. Once across the second will clove hitch the rope to the anchor to prevent loss. The belayer will tie a bowline on a bight. If the span is such that the belay rope cannot be managed from both sides, a second rope may have to be tied to it.

5. If the stream or experience level is very bad, then a second hand line can be installed 30-50 meters downstream. This will be a last resort in case the primary hand line and belay rope fail. This rope can be carried across by the third man across. He will become the far side downstream safety/ security after he has anchored the rope.

6. The far side commander will belay the fourth man across who will become the far side belayer. The far side commander will un hook and manage the personnel as they come across and send them out to establish a security perimeter. He will also maintain a headcount of all personnel on his side of the river.

7. The very last man will dismantle the ropes and be belayed across in the same manner as the first man across.

8. When the unit is completely across the rope team leader will account for all personnel and equipment then move on his mission.

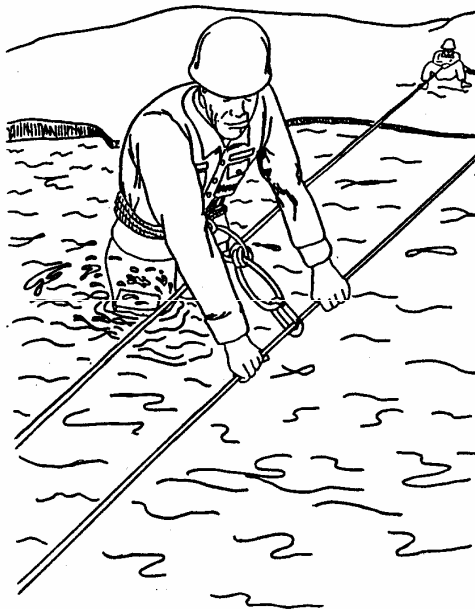


BELAY ROPE FOR CROSSING A HANDLINE.

ELO F

ACTION:	Cross a mountain stream utilizing a hand line
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas, a one rope bridge installed as a hand line, and a climbing rack with adequate hardware and sling material
STANDARD:	Cross a mountain stream utilizing a hand line IAW the NWTC Mountain Operations Manual.

Learning Step/Activity 1 - Crossing a Stream with a Hand Line



STREAM CROSSING USING A HANDLINE

a. The crossing procedure is as follows:

1. The personnel will have their harness on and their uniform in configuration prior to arrival.
2. The rope team commander brings personnel forward to the downstream side of the rope on at a time.
3. The rope team commander hooks the soldier to the system and sends them across. The next soldier in line belays the soldier ahead. The process is the opposite on the far side.
4. The soldier crossing should strive to get across as quickly as practical. The feet are shuffled along the bottom; the hands are on the hand line either side of the carabiner pulling him.
5. Under most circumstances, the hand line should be crossed one person at a time. This keeps rope stretch and load on the anchors to a minimum.
6. Rucksacks can be either carried on the back the same way as for individual crossings, or they can be attached to the hand line and pulled along behind the individual.
7. If a large amount of equipment must be moved across the stream, especially heavier weapons such as mortars, recoilless rifles, etc., then a site should be selected to install a rope bridge.

b. River and stream crossings present one of the most hazardous situations faced by the military mountaineer. The following safety procedures are minimum guidelines that should be followed when conducting a river or stream crossing.

1. All weak and non-swimmers should be identified prior to a crossing so that stronger swimmers may give assistance in crossing.
2. Not every river or stream can be crossed safely. It is always possible to cross at a different time or place, use a different technique or choose another route.
3. The technique used is directly dependent upon water depth, speed of the current, stream bottom configuration, width of the stream, and individual experience.
4. The safest methods of crossing are always with the use of a hand line or one-rope bridge.
5. If the installation of a hand line or rope bridge becomes too difficult at a given crossing site, than that site should be considered too hazardous and another site selected.
6. A lookout should be posted 50 to 100 meters upstream to observe for any obstacles that may be carried downstream and interfere with the crossing.
7. When conducting individual crossings (those without a hand line or rope bridge), lifeguards should be posted down stream with poles or ropes prepared to throw a rope, for assistance or rescue.
8. When it is known ahead of time that a rope installation will be required for crossing, it is advisable to have at least two life vests or other PFD's on hand to provide additional safety for the strong swimmer who must establish the far anchor, and the last man across who retrieves the system.

ELO G

ACTION:	Describe survival swimming techniques used in mountain streams
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas and personal floatation devices
STANDARD:	Describe survival swimming techniques used in mountain streams IAW the NWTC Mountain Operations Manual.

Learning Step/ Activity 1- Survival Swimming Techniques

a. There are times when you might be alone and have no choice but to swim across, or there may be a time that you find yourself suddenly plunged into a swift river or rapids. In either case, the following techniques could save your life.

1. Immediately jettison any equipment or clothing that restricts movement.
2. Do not try to fight the current. Get onto your back with the feet downstream and fanning the hands alongside the body to add buoyancy and to fend off submerged rocks. Use the feet to protect the rest of the body and to fend off submerged rocks. Maneuver towards shore using the arms to steer.
3. Keep the head above water to observe for obstacles and attempt to maneuver away from them.
4. Try to avoid backwater eddies and converging currents as they often contain dangerous swirls. Avoid bubbly water under falls as it has little buoyancy. Breathe between the wave troughs.
5. If the shore is too difficult to reach, seek out the closest and safest spot, such as a sandbar, to get yourself out of the water as quickly as possible. Hypothermia will set in quickly in northern waters.

ELO H

ACTION:	Recover a hand line
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas, a 50 meter 11mm Kernmantle or 120 foot Army Green line rope, installed as a hand line.
STANDARD:	Recover a hand line IAW the NWTC Mountain Operations Manual.

Learning Step/Activity 1 - Recovering a Hand Line

To immediately retrieve the one rope bridge, the system is broken down before the last man crosses. The last man will tie-in or attach himself to the rope (para A.1. Install a one-rope bridge for a mountain stream crossing) and be belayed across the obstacle by a person on the far side. The installation may be left in place and retrieved at a later time.

SECTION IV**SUMMARY**

**Check on
Learning**

- a. What is the proper position for survival swimming?
On your back, feet down stream, hand/arms used to maneuver and ward off obstructions.
- b. What is the easiest place to cross?
At the widest point, as this is where it is usually shallowest.
-

**Review and
Summarize
Lesson**

ACTION:	Conduct a mountain stream crossing
CONDITION:	In a field environment given a moderate flowing mountain stream or river, with adequate entry and departure points and suitable "holding" areas, a 50 meter 11mm static Kernmantle or 120 foot Army Green line rope, and a climbing rack with adequate hardware and sling material
STANDARD:	Conduct a mountain stream crossing IAW the NWTC Mountain Operations Manual.

**Transition to
next lesson**

As per the NWTC training schedule; dependent upon the course in conduct

SECTION V**STUDENT EVALUATION**

**Testing
Requirements**

Students will be tested on this task during the written test as per the NWTC training schedule for this course.

**Feedback
Requirement**

Students will receive two opportunities to pass each event tested. Re-training will be conducted for students that fail the first iteration of testing. Refer to M020 for specifics.
